**Exercises:**

1. Perform a function that calculates the area of a square.

2. Perform a function that calculates the factorial of a number.

3. Perform a function that takes a random integer between 0 and 9, ask a number to the user and inform them if they were correct or not.

4. Perform a function that takes a random integer between 0 and 9 and asks a number to the user until it is correct.

5. Perform a function that defines a two-row matrix with numbers from 1 to 10, you ask the user for two numbers and modify those numbers in the matrix by the value -1.

6. Perform a function that defines two matrices, the matrix x and its transpose; the function has to sum both matrices

Example. x = $\begin{pmatrix} 1 & 3 \\ 2 & 4 \end{pmatrix}$

7. Perform a function that defines two matrices, matrix A and B; check if there is any

common number, if so, replace it with the value -1.

A = $\begin{pmatrix} 1 & 3 \\ 2 & 4 \end{pmatrix}$ B = $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

8. Perform a function that is passed a number and an matrix by parameter. The function should check if the number is in the matrix and count the number of times that number is in the matrix.

9. Create a function called "sumMatrix". The function has to sum the matrix by row and insert the result into a vector called "RowSum"; and the sum by columns and it will insert in a vector that is called “SumColumns”

10. Create a function called “contabilizarNumMatriz”. The function must count how many times each number of matrix appears in the matrix; the result must be inserted in another matrix, both the number and the quantity that number appears

A = $\begin{pmatrix} 1 & 3 \\ 3 & 4 \end{pmatrix}$ B = $\begin{pmatrix} 1 & 1 \\ 3 & 2 \\ 4 & 1 \end{pmatrix}$

11. Define a function that creates a vector A, for example, A = (2,4,5,7); you create another vector B, for example B = (1,2,3,6,8). The function must create two resulting vectors, one vector that returns the matching numbers and in others the non-matching numbers. Both vectors must be ordered from least to greatest. There should be no repeated numbers in the vectors. Res1 = (2); Res = (1,3,4,5,6,7,8)

12. Define a function that creates a vector A, for example, A = (2,4,5,7); you create another vector B, for example B = (1,2,3,6,8). The function must create two resulting vectors, one vector that returns the even numbers and in others the odd numbers. Both vectors must be ordered from highest to lowest. If there are matching numbers, it will only appear once in the resulting vector. Res1 = (8,6,4,2); Res = (7,5,3,1)

13. Define a function that creates a vector A ordered from least to greatest, for example, A =(2,4,5,7); ask for a number by keyboard that is between the minimum number of the vector and the maximum; in the example it would be 2 and 7; check if the number keyboard input exists in vector; if it does not exist you must insert it in the position correct, in order from least to greatest:

    a) using the sort ().

    b) without using the sort ().

14. Create a function called "CalculateData". The function should create an array with the notes of the students of two subjects. The function should show the data as shown in the example, including row and column names. The function shall:

    - Calculate which is the minimum and maximum grade of each subject

    - Calculate which is the minimum and maximum grade of both subjects

    - Calculate how many students have passed both subjects

    - Ask the teacher for a grade (consider that the grade is valid); shall count how many students have obtained that grade.

15. Create a "Hit" function. The function must create a vector, for example A =(2,3,6,1,7,1). Next you must create an array with “*”, as many as numbers in the vector beech. The function must request numbers (between 1 and 10) from the user by keyboard, it must check if that number exists in the vector, if it exists you must put in the place of the number an "*" and insert the number in the matrix.

    a) The user can enter as many numbers as elements in the vector beech.

    b) The user must enter numbers until there is no “*” in the matrix

16. Create a function called "CalculateHeightandWeights". The function should create an array with the data shown in the table including the row names and columns. The function shall:

    - Calculate what is the height and the minimum weight.

    - Calculate how many people have exceeded the average weight and height of the table data

    - Request a height and weight to the user (consider that they are valid data) must count how many people qualify.

    a) Perform the exercise with while loops
    b) Perform the exercise with for loops
    c) Perform the exercise with repeat loop

Example:

| | Height | Weight |
|---|---|---|
| Pepe | 1.70 | 70 |
| John | 1.65 | 70 |
| Antonio | 1.80 | 76 |

The minimum height is: 1.65

The minimum weight is: 70

There are 1 that exceed or equal the weight and average height (1.716667, 72)

[1] "Enter a height:  1.70

[1] "Enter a weight: 1:70

There are 1 people with the entered height and weight